

1.0 SCOPE

This standard covers the minimum requirements for messengers and covered tree wire conductors used with grounded aerial spacer cable distribution systems, 15 kV maximum. The conductor specification portion of this standard covers tree wire in all specified sizes, and can be utilized in either a spacer cable system or tree wire application.

2.0 PRODUCT REQUIREMENTS

2.1. Messenger

2.1.1. Purpose

The messenger is used to support spacer cable systems. The messenger’s strength shall protect the system from falling trees and branches as well as continue to support the cable during high wind loads and icing conditions.

2.1.2. Product Description

The messenger serves as the support member for spacer cable systems. Two constructions of messenger shall be Alumoweld-Aluminum (AWA). The strands used to manufacture these types of messengers shall be a combination of aluminum clad steel wires and 1350-H19 aluminum wires.

2.1.3. Applicable Codes and Standards

The messenger in this specification shall meet and/or exceed all requirements of the latest editions of ASTM B415-16 – Standard Specification for Hard-Drawn Aluminum-Clad Steel Wire. The messenger shall further meet and/or exceed those applicable standards not stated herein but referenced by ASTM B415-16.

2.1.4. Standard Messenger Sizes

Messenger supplied under this category shall be sized per the table below:

Size	Overall Dia. (in.)	AW x Wire Dia. (in.)	Al x Wire Dia. (in.)	Approx. Weight (lbs/1000’)	Breaking Strength (lbs.)	Division ID
252 AWA	0.385	5 x 0.1285	2 x 0.1285	218	11,960	78847
0052 AWA	0.546	5 x 0.1819	2 x 0.1819	438	20,420	78846

2.1.5. Packaging

Reels shall have 18 to 24 inches of inside tail wire exposed through the reel starthole (nearest flange when cable pay-off is in a clockwise direction) and secured to the reel

Specification

flange. The non-returnable wooden reels shall have 3 inch minimum diameter center arbor holes and 1½ inch minimum diameter drive pin holes located 6 to 21 inches from the spool flange center per NEMA WC26. Both ends of each conductor length shall be sealed with an end cap or hermetically as to provide suitable mechanical protection for safety of all personnel. Unless specified otherwise on the purchase order, detailed cable packaging is described in the following table:

Size	Approx. Feet Per Reel	Max. Flange Diameter (in.)	Max. Overall Reel Width (in.)	Division ID
252 AWA	8,000	42	34	78847
0052 AWA	4,000	42	34	78846

2.2. Covered Conductor

2.2.1. Purpose

This conductor is used for primary overhead distribution where limited space is available or desirable for rights of way. It is installed as an uninsulated conductor; however, the covering shall be effective in preventing direct shorts and instantaneous flashovers should tree limbs or other objects contact conductors in such close proximity. Conductor is to be installed with other spacer cable conductors and a supporting messenger through a series of space-maintaining devices (spacers). Conductors shall be rated for continuous operation at 75°C.

2.2.2. Product Description

2.2.2.1. Conductor

Conductors shall be compact round, concentrically stranded, 1350-H19 hard drawn aluminum.

2.2.2.2. Conductor Shielding

Conductor shielding shall be an extruded black semiconducting polymer meeting physical requirements of ANSI/NEMA WC 74. Nominal thickness of shielding shall be 15 mils. The minimum thickness at any point shall not be less than 0.010”.

2.2.2.3. Conductor Covering

- 1) The conductor covering shall consist of two layers thermally bonded to each other and to the conductor shielding.
- 2) The inner layer shall be extruded natural low density polyethylene, complying with ASTM Specification D-1248 latest edition, for Type I, Class A, Category 5, Grade E4 material. Nominal thickness of the inner layer shall be 75 mils.

PRIMARY CONDUCTORS – SPACER CABLE
For Overhead Distribution Applications, 15 kV Max.

TDMIS-9063

Revised 11/2019

Specification

- 3) The outer layer shall be an extruded black, track resistant, high density polyethylene, complying with ASTM Specification D1248 latest edition, for Type III, Class C, Category 5, Grade J5 material. Nominal thickness of the outer layer shall be 75 mils.
- 4) Overall covering (diameter) tolerances shall be limited to nominal plus 20 mils or nominal minus 10 mils for all conductors. Nominal outer diameters are shown in Section 2.2.4.
- 5) Positive adhesion of all extruded layers must be guaranteed.
- 6) Eccentricity of overall cover to be limited to 15.0 percent maximum.

2.2.3. Applicable Codes and Standards

The conductor in this specification shall meet and/or exceed all requirements of the latest editions of the standards listed below. The conductor shall further meet and/or exceed those applicable standards not stated herein but referenced by the below standards.

- a) ANSI/NEMA WC 74 / ICEA S-93-639 – 5-46 kV Shielded Power Cable for Use in the Transmission and Distribution of Electric Energy
- b) ASTM B230 – Standard Specification for Aluminum Conductors, 1350-H19 for Electrical Purposes
- c) ASTM B231 – Standard Specification for Aluminum Conductors, Concentric-Lay-Stranded 1350 Conductors
- d) ASTM B400 – Standard Specification for Compact Round Concentric-Lay-Stranded Aluminum 1350 Conductors
- e) ASTM D1248 – Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable

2.2.4. Standard Conductor Sizes

Conductor supplied under this category shall be sized per the table below:

Size	Strands	Nominal O.D. (in.)	Approx. Weight (lbs/1000')	Division ID
1/0 AWG	7	0.666	215	78840
556.5 kcmil	19	1.120	752	19967

2.2.5. Testing

Quality assurance tests shall be performed on each reel. Test reports shall be furnished upon request of the purchaser.

Tests shall include the following measurements:

PRIMARY CONDUCTORS – SPACER CABLE
For Overhead Distribution Applications, 15 kV Max.

TDMIS-9063

Revised 11/2019

Specification

- a) Conductor diameter
- b) Wall thickness
- c) Finished diameter
- d) Concentricity
- e) AC Spark

AC spark test shall be performed continuously as the cable is being extruded. The applied AC voltage shall be 15,000 Volts.

2.2.6. Manufacturer Identification

- a) Manufacturing information shall be indent printing on the center wire of stranded conductors. Manufacturer’s name or symbol and date of manufacture to be repeated every twelve inches.
- b) Alternate identification may be made by use of color-coded threads installed adjacent to the conductor.
- c) Sequential footage markings at two-foot intervals shall be furnished using “ink jet” technology on all spacer cable coverings. Both the beginning and tail end footage markings are to be stenciled on the reel flange in addition to being recorded on the reel tag.
- d) Indent printing on the outside covering is not permissible.
- e) Reel markings on weather resistant reel tags are to include: DOP Division ID, shipping location, length of cable, gross and net weights, purchase order number, manufacturer’s name, date of manufacture, conductor size and stranding, covering material and thickness, manufacturer’s production run number, and reel serial number.

2.2.7. Packaging

Cable shall be shipped packaged with a single conductor on each reel. Reels shall have 18 to 24 inches of inside tail wire exposed through the reel start-hole [nearest flange when cable pay-off (i.e., conductor exiting from the top of reel) is in a clockwise direction] and secured to the reel flange. The non-returnable wooden reels shall have 3-inch minimum diameter center arbor holes and 1½-inch minimum diameter drive pin holes located 6 to 21 inches from the spool flange center per NEMA WC26. Both ends of each conductor length shall be sealed with an end cap or hermetically as to provide suitable mechanical protection for safety of all personnel. Unless specified otherwise on the purchase order, cable packaging shall be per the following table.

Size	Approx. Feet Per Reel	Max. Flange Diameter (in.)	Max. Overall Reel Width (in.)	Division ID
1/0 AWG	3,000	50	34	78840
556.5 kcmil	3,000	68	44	19967